



PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:)	Docket No: LAM1P077A2
)	
Kuthi et al.)	Group Art Unit: 1763
)	
Application No: 10/796,836)	Examiner: Alejandro Mulero,
)	Luz L.
)	
Filed: March 8, 2004)	Date: July 27, 2006
)	
For: SEMICONDUCTOR PROCESS CHAMBER)	
ELECTRODE)	

CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on July 27, 2006.

Signed

Melinda M. Ward

PRE-APPEAL BRIEF REQUEST FOR REVIEW

Mail Stop: AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request. This request is being filed with a Notice of Appeal. The review is requested for the reasons stated below.

Claims 1-14 remain pending in the application. Reconsideration of the present case is earnestly requested in light of the following remarks. Please note that for brevity, only the primary arguments directed to the independent claims are presented, and that additional arguments, e.g., directed to the subject matter of the dependent claims, may be presented if and when the case proceeds to Appeal.

ARGUMENT

Summary

The Examiner has exhibited clear errors in his rejections because:

- 1) Claims 1-14 are not rendered obvious by *Tomita et al.* (U.S. Patent No. 5,593,540) in view of *Chang et al.* (U.S. Patent No. 4,854,263).
- 2) Claims 1-14 are not rendered obvious by *Chang et al.* (U.S. Patent No. 4,854,263) in view of *Tomita et al.* (U.S. Patent No. 5,593,540).

Pending Claims

Claims 1-14 were rejected under 35 U.S.C. 103(a) as being anticipated by *Tomita et al.* (U.S. Patent No. 5,593,540) in view of *Chang et al.* (U.S. Patent No. 4,854,263). Claims 1-14 were also rejected under 35 U.S.C. 103(a) as being anticipated by *Chang et al.* (U.S. Patent No. 4,854,263) in view of *Tomita et al.* (U.S. Patent No. 5,593,540). The following clear errors in the Examiner's rejections are noted.

Independent Claims 1 and 5

With regard to claims 1 and 5, the Examiner asserts that *Tomita et al.* shows the invention substantially as claimed. The Examiner points out that *Tomita et al.* fails to expressly disclose where the electrode opening diameters are greater than the gas feed hole diameters. The Examiner further states that *Chang et al.* discloses an electrode with electrode openings having diameters that are greater than gas feed hole diameters. The Examiner asserts that it would have been obvious to one of ordinary skill in the art to modify the apparatus of *Tomita et al.* as to have electrode openings of *Chang et al.* because this would enhance dissociation and reactivity of the gases.

The Examiner has agreed with the Applicants' submission that *Tomita et al.* or *Chang et al.* does not disclose "the larger surface being capable of inducing an increased bias voltage at a point closer to the substrate location and a decreased bias voltage at a point closer to the second surface of the electrode," as defined in claim 1. The Examiner has also agreed with the Applicants' submission that *Tomita et al.* or *Chang et al.* does not disclose "the larger second surface area being capable of inducing an increased bias voltage at a substrate processing surface," as defined in claim 5. The Examiner argues that "the fact that such limitations are not expressly stated in the references does not take away from the fact that these limitations are inherently present in the references because of the structure of the *Tomita et al.* and *Change et al.* apparatus."

MPEP 2112 IV states that “The fact that a certain result or characteristics may occur or be present in the prior art is not sufficient to establish the inherency of that result or characteristics,” and “To establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill.” Neither *Tomita et al.* nor *Chang et al.* discusses or mentions bias voltage in their specifications. Therefore, the missing descriptive matters regarding inducing an increased bias voltage described above in claims 1 and 5 cannot be established as necessary. As a consequence, the case of inherency is not established.

To establish a *prima facie* case of obviousness, the prior art reference must teach or suggest all the claim limitations. (see MPEP2143) Since the case of inherency is not established, as argued above, *Tomita et al.* and *Chang et al.* combined do not teach or suggest all the claim limitations of claims 1 and 5.

In addition, the Examiner asserts that modifying *Tomita et al.*'s apparatus with *Chang et al.*'s electrode openings having diameters greater than gas feed hole diameters would enhance dissociation and reactivity of the gases. In the Argument section of Appeal Brief dated August 22, 2005, Applicants have stated that the *Tomita et al.* apparatus is constructed in such a manner as to prevent plasma flowing into the electrode opening. Applicants also have stated that in a re-formed electrode and gas feed hole structure as proposed by the combination of *Tomita et al.* and *Chang et al.*, the primary principle of the operation of the Tomita et al. structure is not only modified, but defeated. In addition, in the Amendment dated February 16, 2006, Applicants have stated that “it has never been indicated that in *Tomita et al.*'s teaching that the $\text{CF}_4/\text{CHF}_3/\text{Ar}$ chemistry used in its chamber needs enhanced dissociation or enhanced reactivity,” and “the etching plasma chemistry and etching performance would undoubtably be altered,” by the re-formed electrode and gas feed holes structure. Therefore, one having ordinary skill in the art would not have combined *Tomita et al.* and *Chang et al.*

To establish a *prima facie* case of obviousness, there must be some suggest or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. (see MPEP2143). Here in view of the incorrect characterizations of *Tomita et al.* and *Chang et al.*, there is no suggestion or motivation to combine reference teachings.

With regard to claims 1 and 5, the Examiner also asserts that *Chang et al.* shows the invention substantially as claimed. The Examiner points out that *Chang et al.* fails to expressly disclose “the electrode having a center region, a first surface and a second surface, ..., the larger surface area being capable of inducing an increased bias voltage at a point closer to the second surface of the electrode when a plasma is struck in a space defined between the second surface and the substrate location.” The Examiner further states that *Tomita et al.* discloses what’s missing in *Chang et al.* The Examiner asserts it would have been obvious to one of ordinary skill in the art to modify the apparatus of *Chang et al.* so as to include the electrode of *Tomita et al.* because such an electrode configuration will allow for adequate introduction of gases into the processing chamber.

As argued above, *Tomita et al.* or *Chang et al.* does not disclose “the larger surface being capable of inducing an increased bias voltage at a point closer to the substrate location and a decreased bias voltage at a point closer to the second surface of the electrode,” as defined in claim 1. *Tomita et al.* or *Chang et al.* also does not disclose “the larger second surface area being capable of inducing an increased bias voltage at a substrate processing surface,” as defined in claim 5. Since the case of inherency is not established, as argued above, *Tomita et al.* and *Chang et al.* combined do not teach or suggest all the claim limitations of claims 1 and 5.

In addition, the Examiner asserts that modifying the apparatus of *Chang et al.* so as to include the electrode configuration of *Tomita et al.* will allow for adequate introduction of gases into the processing chamber. The electrode of *Chang et al.* is used for PECVD deposition. With flow rate of 110 sccm/4.5 slm of SiH₄/N₂ gas chemistry, the resulting film is characterized by a very high deposition rate of about 4,500 Angstroms per minute and with relatively low hydrogen content. (see Page 6, line 60 to Page 7, line 1) There is no indication in Chang et al. that the introduction of gases into the processing system is not adequate. The total flow rates (110 sccm + 4.5 slm) of Chang et al. are higher than the total flow rates of Tomita et al. (e.g. 30 sccm CF₄, 30 sccm CHF₃, and 600 sccm Ar). (see Tomita et al. Page 6, lines 12-13) Therefore, it would not have been obvious to one of ordinary skill in the art to modify the apparatus of Chang et al so as to include the electrode of *Tomita et al.* to allow for adequate (or additional) introduction of gases into the processing chamber.

To establish a *prima facie* case of obviousness, there must be some suggest or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.

(see MPEP2143). Here in view of the incorrect characterizations of *Chang et al.* and *Tomita et al.*, there is no suggestion or motivation to combine reference teachings.

Therefore, the Applicants respectfully submit that the Examiner's rejections of claims 1 and 5 under 35 U.S.C. 103 are in error.

Independent Claims 9 and 13


The Examiner uses the same arguments for rejecting claims 1 and 5 to reject claims 9 and 13. The arguments described above regarding lack of suggestion or motivation to combine reference teachings can be applied for claims 9 and 13. Accordingly, the Applicant respectfully requests that the Examiner withdraw the rejections for claims 9 and 13 under 35 U.S.C. § 103(a).

Dependent Claims 2-4, 6-8, 10-12, and 14

Because a dependent claim incorporates each and every feature of its independent claim, the Applicants submit that each of dependent claims 2-4, 6-8, 10-12 and 14 is patentable with respect to the cited art of record for at least the same reasons provided for its respective independent claim.

Conclusion

In view of the foregoing, the Applicant respectfully submits that all of the pending claims are in condition for allowance. The Applicant kindly requests that the Office withdraws the rejections of claims 1-14, and issues a Notice of Allowance. If the Office has any questions concerning the present Request, the undersigned can be reached at (408) 774-6924. If any additional fees are due in connection with filing this Request, the Commissioner is authorized to charge Deposit Account No. 50-0805 (Order No. LAM1P077A2). Enclosed herewith are the associated Notice of Appeal and Return Receipt Postcard.

Respectfully submitted,
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